

## Station 2: Superior Trunk and Anterior Suprascapular Nerve Block

### “Phrenic Nerve Sparing Techniques for Shoulder Analgesia”

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## ANESTHESIOLOGY

### Superior Trunk Block

#### A Phrenic-sparing Alternative to the Interscalene Block: A Randomized Controlled Trial

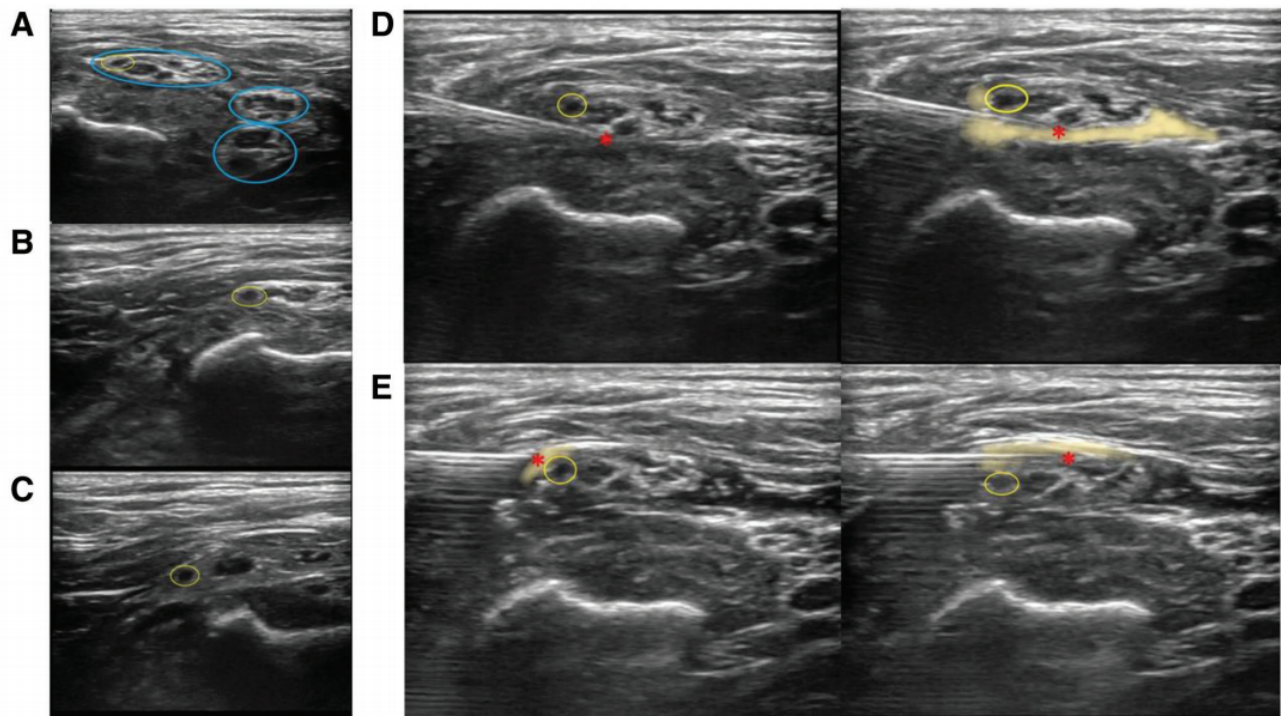
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**Methods:** This randomized controlled trial included 126 patients undergoing arthroscopic ambulatory shoulder surgery. Patients either received a superior trunk block (n = 63) or an interscalene block (n = 63). The primary outcomes were the incidence of hemidiaphragmatic paralysis and worst pain score in the recovery room. Ultrasound was used to assess for hemidiaphragmatic paralysis. Secondary outcomes included noninvasively measured parameters of respiratory function, opioid consumption, handgrip strength, adverse effects, and patient satisfaction.

**Results:** The superior trunk group had a significantly lower incidence of hemidiaphragmatic paralysis compared with the interscalene group (3 of 62 [4.8%] vs. 45 of 63 [71.4%];  $P < 0.001$ , adjusted odds ratio 0.02 [95% CI, 0.01, 0.07]), whereas the worst pain scores in the recovery room were non-inferior (0 [0, 2] vs. 0 [0, 3];  $P = 0.951$ ). The superior trunk group were more satisfied, had unaffected respiratory parameters, and had a lower incidence of hoarseness. No difference in handgrip strength or opioid consumption were detected. Superior trunk block was associated with lower worst pain scores on postoperative day 1.

**Conclusions:** Compared with the interscalene block, the superior trunk block provides noninferior surgical anesthesia while preserving diaphragmatic function. The superior trunk block may therefore be considered an alternative to traditional interscalene block for shoulder surgery.



**Fig. 1.** Ultrasonography of superior trunk block. *Yellow ovals* mark suprascapular nerve. *Red asterisks* correspond to needle tip. (A) Superior trunk, middle trunk, and inferior trunk are marked with *blue ovals*. (B, C) As we scan distally, the suprascapular nerve is branching off the superior trunk (B) and diving under the omohyoid (inferior belly, C). (D) Needle is placed posteriorly to the superior trunk as local anesthesia is injected (local anesthetic spread in *yellow highlight*). (E) Needle is repositioned anteriorly and laterally as local is injected (see also the video in the Supplemental Digital Content, <http://links.lww.com/ALN/B986>).

# Comparison of Anterior Suprascapular, Supraclavicular, and Interscalene Nerve Block Approaches for Major Outpatient Arthroscopic Shoulder Surgery

## A Randomized, Double-blind, Noninferiority Trial

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**Background:** The interscalene nerve block provides analgesia for shoulder surgery, but is associated with diaphragm paralysis. One solution may be performing brachial plexus blocks more distally. This noninferiority study evaluated analgesia for blocks at the supraclavicular and anterior suprascapular levels, comparing them individually to the interscalene approach.

**Methods:** One hundred-eighty-nine subjects undergoing arthroscopic shoulder surgery were recruited to this double-blind trial and randomized to interscalene, supraclavicular, or anterior suprascapular block using 15 ml, 0.5% ropivacaine. The primary outcome was numeric rating scale pain scores analyzed using noninferiority testing. The predefined noninferiority margin was one point on the 11-point pain scale. Secondary outcomes included opioid consumption and pulmonary assessments.

**Results:** All subjects completed the study through the primary outcome analysis. Mean pain after surgery was: interscalene = 1.9 (95% CI, 1.3 to 2.5), supraclavicular = 2.3 (1.7 to 2.9), suprascapular = 2.0 (1.4 to 2.6). The primary outcome, mean pain score difference of supraclavicular–interscalene was 0.4 (–0.4 to 1.2;  $P = 0.088$  for noninferiority) and of suprascapular–interscalene was 0.1 (–0.7 to 0.9;  $P = 0.012$  for noninferiority). Secondary outcomes showed similar opioid consumption with better preservation of vital capacity in the anterior suprascapular group (90% baseline [ $P < 0.001$ ]) and the supraclavicular group (76% [ $P = 0.002$ ]) when compared to the interscalene group (67%).

**Conclusions:** The anterior suprascapular block, but not the supraclavicular, provides noninferior analgesia compared to the interscalene approach for major arthroscopic shoulder surgery. Pulmonary function is best preserved with the anterior suprascapular nerve block.

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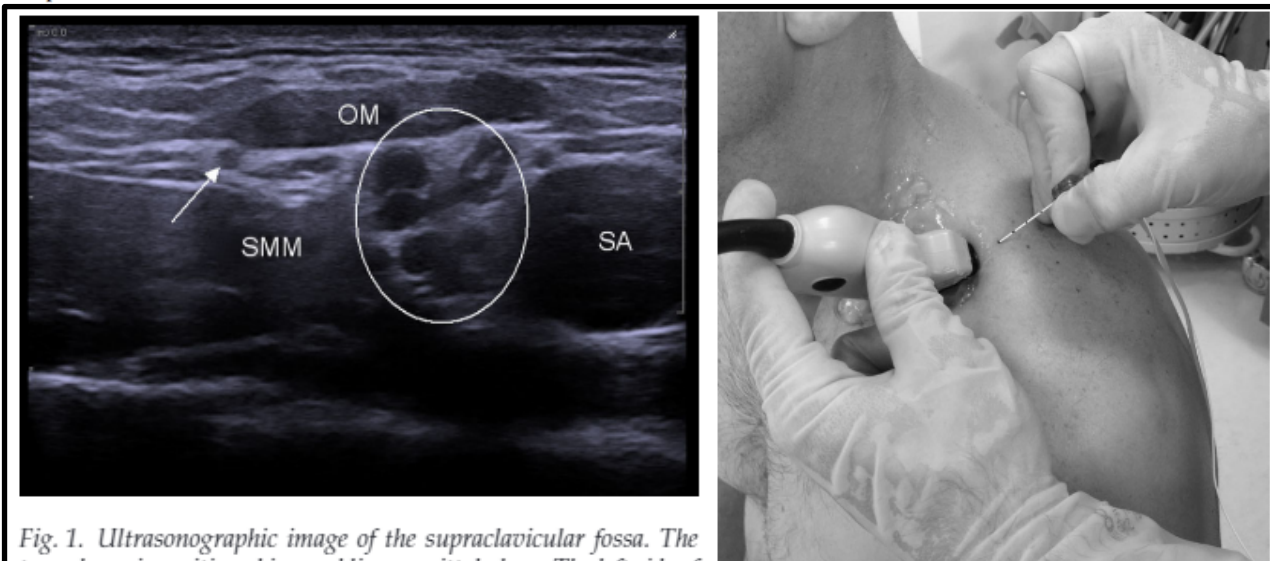


Fig. 1. Ultrasonographic image of the supraclavicular fossa. The transducer is positioned in an oblique sagittal plane. The left side of the image is oriented posterolaterally. Important landmarks are the subclavian artery (SA), the omohyoid muscle (OM), the scalenus medius muscle, and the supraclavicular part of the brachial plexus (encircled). The arrow marks the suprascapular nerve (SSN) in a fascia layer under the OM in close relation to the brachial plexus.

Fig. 2. Volunteer, transducer, and needle position. Lateral view of the shoulder region demonstrating in-plane needle insertion at the upper margin of the trapezius muscle. The transducer is orientated in the oblique sagittal plane and the hand of the operator is resting on the clavicle. The shoulder joint is in neutral position and the hand of the volunteer is resting on the thigh.

### Ultrasound-guided block of the suprascapular nerve – a volunteer study of a new proximal approach

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